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making the Sun's disc 8 inches in diameter; III and IV were observed with a HERSCHEL sun-prism and eyepiece magnifying 150 diameters. The clock corrections are from observations by myself with a portable transit instrument of  $1\frac{3}{4}$  inches aperture.

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OBSERVATIONS OF THE TRANSIT OF *MERCURY*,  
NOVEMBER 10, 1894, AT COLLEGE PARK,  
UNIVERSITY OF THE PACIFIC.

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BY PROFESSOR R. G. AITKEN.

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[Abstract.]

Contact I. Lost in the fog.

Contact II.  $19^h 58^m 48^s.6$  P. S. T. This time is certainly too late; possibly as much as 10 or 15 seconds. When the planet was first seen, free of the fog, it had already entered on the disc and the ring of sunlight around it was complete.

Contact III.  $1^h 11^m 34^s.3$  P. S. T.

Contact IV.  $1^h 13^m 18^s.0$  P. S. T.

The observations were made with the 6-inch equatorial of the college observatory. The clock corrections are from observations by myself with the portable transit instrument.

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OBSERVATIONS OF THE TRANSIT OF *MERCURY*,  
NOVEMBER 10, 1894, IN SAN FRANCISCO.

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BY F. R. ZIEL.

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Professor E. S. HOLDEN,

Director LICK Observatory, Mount Hamilton.

*Dear Sir:* The transit of *Mercury*, November 10, was observed by me with my  $2\frac{7}{8}$ -inch refractor, with a power of 150,

by projection on a cardboard screen, on a scale of 12 inches for the diameter of the image of the Sun.

Owing to a dense fog contacts I and II could not be observed, the Sun remaining obscured until 10 o'clock.

The observations of contacts III and IV were as follows :

III. 1<sup>h</sup> 11<sup>m</sup> 23<sup>s</sup> P. S. T.

IV. 1 13 2

The seeing was fairly good. The time was noted by Mr. F. H. McCONNELL, who received the correct time at noon, direct from the LICK Observatory.

Very truly yours,

F. R. ZIEL.

SAN FRANCISCO, November 10, 1894.

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#### CONCERNING AN ATMOSPHERE ON *MARS*.\*

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BY W. W. CAMPBELL.

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In forming an estimate of the extent of the atmosphere surrounding the planet *Mars*, a great many classes of observed phenomena must be considered. I shall try, in the following pages, to bring together and to discuss very briefly the most important facts bearing upon this question.

(1) *The Small Mass of the Planet.*—It is reasonable to suppose that the mass of the atmosphere surrounding a planet is roughly proportional to the mass of the planet itself. The largest planets would have the most extensive atmospheres. This rule actually appears to hold good. There is no evidence of an atmosphere on our Moon, nor on any of the satellites in the solar system. There is substantially no evidence of an atmosphere on the small planet *Mercury*, but there are unmistakable evidences of extensive atmospheres on the large planets *Jupiter*, *Saturn*, *Uranus* and *Neptune*, compared with which our own atmosphere is very slight.

Now, the mass of *Mars* is only 0.11 that of the Earth. The area of the surface is 0.28 that of the Earth. If the atmospheres of the two planets are proportional to their masses the quantity

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\* This question relates simply to the *extent* and *character* of the Martian atmosphere. Whether or not an atmosphere of any given extent and character will support life is quite outside of the astronomer's province.